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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,117	01/05/2004	Fabian Wenger	4114-9	1361
23117 7590 05/17/2007 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER FLORES, LEON	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 05/17/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/751,117

Applicant(s)

WENGER ET AL.

Examiner

Leon Flores

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/15/2007 have been fully considered but they are not persuasive.

Response to Remarks

The applicant argues that, "there is no evidence in Weigand clearly teaches that the training patterns are in fact quantized after scaling".

The examiner respectfully disagrees. One skilled in the art would know that, scaling of a signal may take place either before or after quantization. However, taking the contrary, the examiner has issue a new ground of rejection to substantiate for the scaling prior to quantization, and the variable scaling factor limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims (1-2, 7, 14-16) are rejected under 35 U.S.C. 102(b) as being anticipated by Weigand (US Patent 5,117,441) for the same reasons as set forth in the last Office Action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims (3-6) & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (US Patent 5,117,441), as applied to claims 1 and 16 respectively, and further in view of applicant's admitted prior art (specification, p. 3, lines 10-25, hereinafter, "prior art"), for the same reasons as set forth in the last Office Action.

Claims (8-13) & 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (US Patent 5,117,441), as applied in claims 1 and 16 above respectively, and further in view of Piirainen et al (US Patent 6,144,709), for the same reasons as set forth in the last Office Action.

1. Claims (1-2, 7, 14-16, & 19) are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (US Patent 5,117,441) in view of Olafsson (US Patent 6,023,493).

Re claim 1, Weigand discloses a method in a wireless communication system of providing timing information for a received transmit signal, comprising providing on a receiving side a training signal relating to a known signal portion of the transmit signal

(See fig. 1: 105 & col. 3, line 23); scaling the training signal with a variable scaling factor (See col. 3, lines 24-26); quantizing the scaled training signal (See col. 2, lines 65-68, col. 3, lines 24-26, in Weigand, it is inherent that digital signal processing, i.e. DSP during the encoding stage of the training sequence involves quantization); correlating one or more parts of the received transmit signal with the scaled training signal to obtain one or more correlation results (See fig. 1: 104 & col. 3, lines 20-29); and determining the timing information on the basis of the correlation results. (See col. 3, lines 20-29)

But the reference of Weigand fails to specifically disclose a variable scaling factor. However, Olafsson does. (See col. 5, lines 34-45)

Olafsson discloses an encoder configured to encode digital data by using μ -law or A-law encoding techniques. The output signal generated by the encoder may include information for transmission during a data mode, synchronization or training signals for transmission during an initialization mode, or control or other signaling data employed by a modem system. Furthermore, one skilled in the art would know that μ -law or A-law scale the signal with a variable scaling factor and then quantize it. The benefit of using these techniques is that it brings the level of the signal to a specific level to further improve the dynamic range of the signal.

Therefore, taking the combined teachings of Weigand and Olafsson as a whole. It would have been obvious to one of ordinary skills in the art to have used a variable scaling factor in the system of Weigand, in the manner as claimed, and as taught by Olafsson, for the benefit of improving the dynamic range of the signal by bringing the level of the signal to a specific level.

Re claim 2, the combination of Weigan and Olafsson further disclose that, wherein varying the scaling factor is used to control a complexity of the correlating. (In Weigand, see col. 3, lines 24-26. Furthermore, in order for proper correlation to occur, the training sequences must be scaled and mapped as claimed.)

Re claim 7, the combination of Weigan and Olafsson further disclose that, wherein the provided timing information is an optimum timing instant for synchronization purposes. (In Weigand, see col. 3, line 64 – col. 4, lines 1-6, 29-31).

Claim 14 has been analyzed and rejected w/r to claim 1 above. Furthermore, the reference of Weigand pertains to a processor-based TDMA communications system (col. 2, lines 65-68, col. 4, lines 57-59). Hence, implementing a program product is inherent and necessary as the cited disclosure suggests.

Claim 15 has been analyzed and rejected w/r to claim 14 above. Weigand also discloses hardware implementation. (See col. 4, lines 57-59)

Claim 16 is a system claim comprising elements that would have necessitated the corresponding steps in method claim 1. Therefore, claim 16 has been analyzed and rejected w/r to claim 1 above.

Claim 19 has been analyzed and rejected w/r to claim 16 above.

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2. Claims (3-6, 17, 20) are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (US Patent 5,117,441) and Olafsson (US Patent 6,023,493), as applied to claims 1 and 16 respectively, and further in view of applicant's admitted prior art (hereinafter, "prior art").

Re claim 3, the combination of Weigand and Olafsson fails to explicitly disclose "the training signal comprises complex training values and wherein a real part and an imaginary part of each training value are quantized jointly" as claimed. However, the admitted prior art does in order to reduce the overall complexity of the matched filter during correlation processing (specification, p. 3, lines 10-25).

Taking the combined teachings of Weigand, Olafsson and the applicant's admitted prior art as a whole, it would have been obvious to one of ordinary skill in the art to apply joint quantization of the real and imaginary parts of each complex training value in order to reduce the overall complexity of the matched filter during correlation processing (admitted prior art, in spec. p. 3, lines 10-25).

Re claim 4, the combination of Weigand, Olafsson and applicant's admitted prior art teaches the method according to claim 3, wherein, during quantization, the training values are mapped on a predefined set of pure real and pure imaginary values (admitted prior art, specification p. 3, line 15-21).

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Re claim 5, the combination of Weigand, Olafsson and applicant's admitted prior art teaches that wherein the predefined set of pure real and pure imaginary values comprises a value zero (admitted prior art, specification p. 3, line 15-21).

Re claim 6, the combination of Weigand, Olafsson and applicant's admitted prior art teaches wherein the scaling factor is varied to adjust the number of training values mapped on the value zero (Weigand, see col. 3, lines 34-26, where he teaches that the training sequences are scaled and mapped for proper correlation).

Claim 17 is a system claim corresponding to method claim 3. Hence, the steps in method claim 3 would have necessitated the elements in system claim 17 as claimed. Therefore, claim 17 has been analyzed and rejected w/r to claim 3 above.

Claim 20 has been analyzed and rejected w/r to claim 17.

Claims (8-13, & 18) are rejected under 35 U.S.C. 103(a) as being unpatentable over Weigand (US Patent 5,117,441) and Olafsson (US Patent 6,023,493), as applied to claims 1 and 16 respectively, and further in view of Piirainen et al (hereinafter Piirainen) (US Patent 6,144,709).

Re claim 8, the combination of Weigand and Olafsson discloses the method according to claim 1, but fails to teach that wherein the one or more parts of the receive

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signal are correlated with the scaled training signal by means of a matched filter.

However, Piirainen does. (See col. 1, lines 9-14 & col. 3, lines 30-32.)

Piirainen disclose a method of detecting a call set-up burst in a digital radio system in which a call is set up in a predetermined time slot by a certain call set-up burst which comprises a known training sequence. The position and energy of the maximum point of an impulse response in a time slot are estimated by correlating a sampled, received signal with a known training sequence and computing the average energy of the maximum point of the impulse response per one correlation result. Subsequently, computing the ratio between the averaged maximum energy of the impulse response and the average energy of the other samples of the time slot, and if the ratio is higher than a given threshold, it will decide if a call set-up burst was received in the time slot concerned.

Taking the combined teachings of Weigand, Olafsson and Piirainen as a whole, it would have been obvious to one of ordinary skill in the art to have incorporated a matched filter in the manner as claimed into the system of Weigand, as modified by Olafsson, and as taught by Piirainen, for the benefit of determining if a call set-up message was received by computing the maximum point of the impulse response.

Claim 9 has been analyzed and rejected in view of claim 8 above.

Re claim 10, the combination of Weigand, Olafsson and Piirainen discloses the method according to claim 9, wherein, for each possible timing instant, a channel

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impulse response signal power contained in a respective time window of the received transmit signal is determined. (In Piiraninen, see col. 3, lines 28-55.)

Re claim 11, the combination of Weigand, Olafsson and Piiraninen discloses the method according to claim 10, wherein the step of determining the timing information on the basis of the correlation results comprises determining the time window containing the maximum signal power. (In Piiraninen, see col. 3, lines 28-55.)

Re claim 12, the combination of Weigand, Olafsson and Piiraninen discloses the method according to claim 10, wherein based on the maximum signal power a false alarm detection is performed. (In Piiraninen, see col. 3, lines 62-67 & col. 4, lines 1-4. By determining the maximum energy (impulse response) we can then compute the average energy by subtracting the maximum energy from the total energy. And by comparing the average energy with a predefined threshold, we can, therefore, estimate if a call set-up message was received. Furthermore, one skilled in the art would know that during the search mode there may be false alarm that occur at the designed false alarm rate of the system. To handle the occasional false alarms, it is necessary to have an additional method or circuit that checks to confirm that the received signal at the output of the correlator remains above the threshold.)

Re claim 13, the combination of Weigand, Olafsson and Piiraninen discloses the method according to claim 12, wherein the false alarm detection comprises comparing

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the maximum signal power with a signal power threshold. (In Piiraninen, see col. 3, lines 62-67 & col. 4, lines 1-4.)

Claim 18 is a system claim corresponding to method claim 12. Hence, the steps in method claim 12 would have necessitated the elements in system claim 18 as claimed. Therefore, claim 18 has been analyzed and rejected w/r to claim 12 above.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
April 27, 2007


DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER